

Border Management: Automated System and Beyond

By Riat Chui

Protecting a nation's borders - land, air and sea - from the illegal entry of people, weapons, drugs, contraband and from terror attack is vital to the security as well as economic prosperity of a country. This, however, is getting increasingly complex and difficult nowadays as authorities concerned have to deal with new and ever changing and challenging environment.

Consider the following figures:

- Passenger flow has kept increasing dramatically. According to IATA (The International Air Transport Association), the number of worldwide travellers is expected to increase more than 5% annually in the coming years.
- For air travel alone in 2013, the number of worldwide airport passengers increased by 4.6% to 6.3 billion, registering increases in all six regions (See Table 1 for details) according to ACI (Airports Council International)
- A total of 20.9 million passengers cruised the world in 2012, according to a report by Marina Stojanović in Scientific Journal of Maritime Research 28 (2014). A cruise ship can unload more than 6,000 passengers in an hour.

This huge number of passengers going in and out of a country's borders is further complicated by the fact that they are of

various types, namely

- citizens of the controlled country
- foreigners with visa
- foreigners without visa
- frequent (low risk) travellers
- high risk known individuals
- high risk unknown individuals

Each type of passenger should, in an ideal sense, be handled differently so as to maximise passenger experience without sacrificing any border security concerns. To fully appreciate a border control system currently in place or those that will come into play in the future, let's first take a look at what the system is designed to achieve.

Why Border Control System?

Passengers always want to avoid queues at customs or immigration desks but despite efforts to improve passenger experience over the last decade, the security process remains as taxing today as it was 10 years ago. For one thing, border control authorities have to make sure their various objectives be met. The general ones, needless to say, are things like to

Table 1 - Breakdown of Air Passenger Traffic in 2013 by region

Rank	Region	No. of Passengers	Change from 2012
1	Asia-Pacific	2.06 billion	up 8.7%
2	Europe	1.73 billion	up 3.2%
3	North America	1.57 billion	up 1.1%
4	Latin America-Caribbean	501 million	up 5.5%
5	Middle East	278 million	up 7%
6	Africa	164 million	up 0.5%



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better control immigration, reduce terrorism and contribute to economic growth. There are also specific objectives which are beyond what can be seen on the surface.

Most of time, a nation has to analyse and make very good use of travellers information for strategic planning or informed decisions, and those information can best be generated through a border control system. Specifically, the system should generate information which can assist in catching irregular and illegal immigrants, preventing terrorism and serious criminal activities and facilitating the use of border control resources to target traveller of high risk groups.

From the operational point of view, a border control system should be able to perform a number of other functions too, such as identifying overstayers and facilitating their sanctioning, identifying cross-border movements and potentially risky third country nationals. Compliance of seasonal and other categories of third country national migrants with the migration condition should also be ensured by a border control system.

The Basics of a Border Control System

- eDocuments such as MRP, ePassport, eVisa, Registered Traveller Card
- Manual Border Controls where eMRTDs are handled by border guards to conduct validity check of the documents
- Automated Border Controls where eMRTDs are always handled by its own citizens to validate their documents themselves
- Entry / Exit Database to verify eDocuments of all third country nationals, and register information like date, location of entry/exit and length of stay. It is always connected to the border control gates and works with eMRTDs with or without visa stickers.

A Term Explained

An MRP, or Machine Readable Passport, is a passport that contains a machine-readable zone (MRZ) printed in accordance with International Civil Aviation Organization (ICAO) standard. It is capable of being read manually and with the use of a machine.

An e-passport has an embedded IC chip where the photograph and personal information of the bearer are stored in accordance with ICAO specifications. The information can be read by chip readers at close distance. An ePassport also contains a machine-readable zone.

MRTD, or Machine Readable Travel Document, is an official travel document issued by a state or organisation, and used by its holder for international travel. It contains a standardised format, and various identification details of the holder including a photo (or digital image) with mandatory and optional identity elements.

As highlighted by ST Microelectronics in APSCA's conference on Border Management Information System in December 2014, a border control system has to be

- secure to protect privacy and data integrity
- reliable in terms of both online and offline capability
- interoperable in different locations within a country or even in different countries, connecting through databases and systems
- flexible with fast verification to reduce queues at immigration check points or eGates
- cost effective in global implementation and maintenance, or cost sharing by different countries

Bearing these criteria in mind, it may be helpful to look at a recent EU initiative on border control systems in Schengen Area, FastPass, which brings together various systems and resources to help ensure national borders security and smooth travellers' experience.

The Automated Border Control (ABC) in Schengen Area

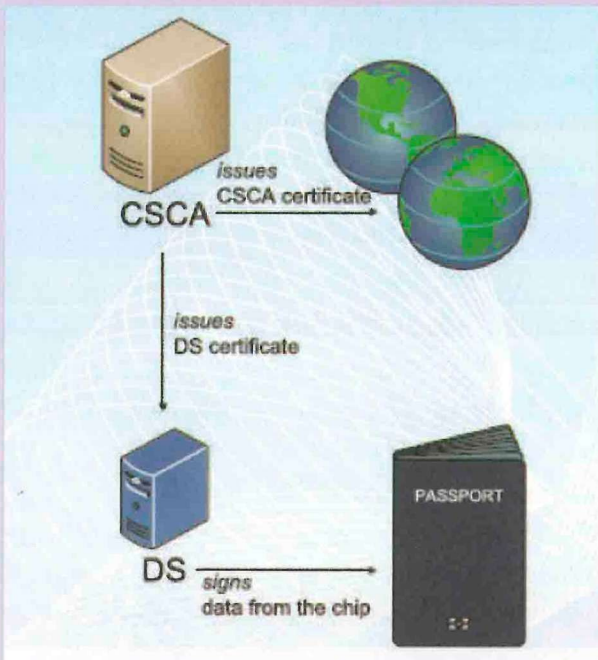
FastPass

FastPass is a harmonised, modular reference approach for ABC gates. It is also a project launched at the beginning of 2013, with expected completion by the end of 2016. By harmonised, it refers to the



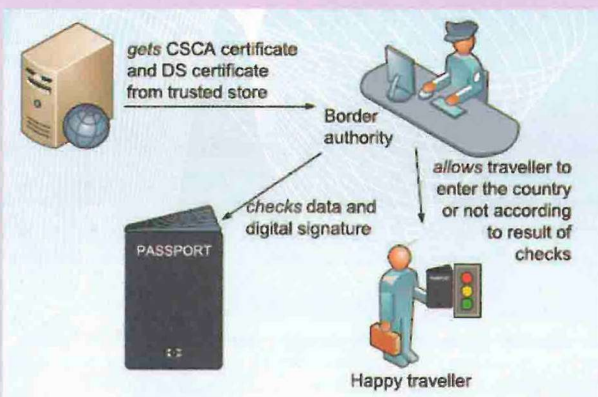
eMRTD, PKI, and Issuance

For an eMRTD, an additional contactless integrated circuit (IC) chip with an antenna, commonly referred to as an RFID chip, is a must. This chip stores data from the travel document data page and the mandatory biometric feature of the passport holder.



Source: ICAO

Border Control Using eMRTD



Source: ICAO

use of common systems and procedures across all countries concerned based on feedback from travellers and border guards.

With 26 member states, Schengen area is experiencing more than 800 million travellers every year. Every traveller wishes to

cross external border with maximum convenience and without losing too much time at border controls. At the same time, border guards must still fulfil their obligation to secure the EU borders against illegal immigration, terrorism, crime and other threats. Thus, both security and mobility within the EU are the prime concerns.

In the project, FastPass is to introduce a harmonised user interface, using the full potential of ID documents so that travellers would be able to pass through ABCs smoothly and time-efficiently. The objectives of FastPass are as follows:

Objective 1 - Integrating Entry/Exit System (EES) and Registered Traveller Programme (RTF)

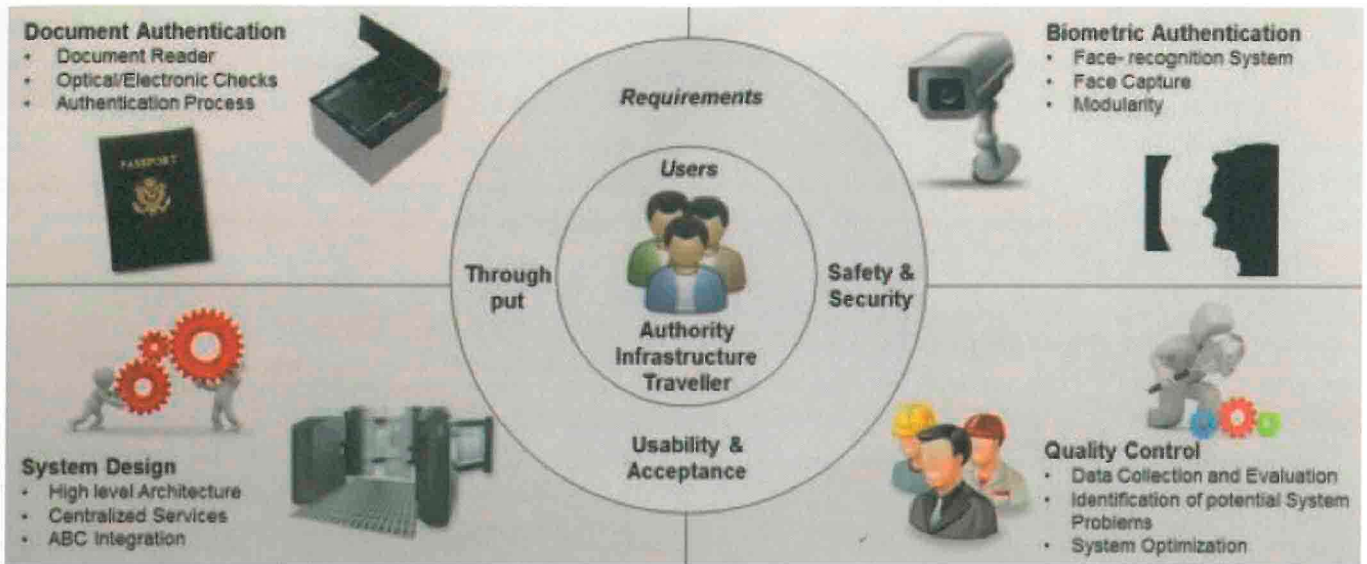
This is the first objective of FastPass, and also part of the Smart Border Initiatives to strengthen the overall governance of Schengen Area especially when internal border controls are largely dismantled. The EES permits accurate and reliable calculation of authorised stays as well as identification and verification of travellers. Current system of calculation based on the stamps in the passports will be replaced by the electronic registry of the dates and place of entry and exit of third-country nationals admitted for short stays. The Registered Traveller Programme will facilitate border crossings for frequent, pre-vetted and pre-screened third country travellers at the Schengen external borders. Registered travellers can use Automated Border Control facilities whenever available at the Schengen border crossing points. To fully exploit their power of EES and RTF, they need to be combined with automated border control (ABC) systems so that border check procedures for third country nationals entering the EU will be sped up without compromising border security.

Objective 2 - Harmonising ABC usability

Given the different ABC test installations, pilot solutions and procedures currently in use, it is the objective of FastPass to harmonise ABC usability and evaluate users' satisfaction. An optimised ABC will meet the needs of travellers and border guards, making their travel and work smooth, fast and secure.

Objective 3 - Supporting an innovative border crossing concept

FastPass also aims to support an innovative border crossing concept by examining current automation of border crossing process which pays little with little or no connection to the



(Source:Fastpass Project Websiee)

overall security (e.g. security checks) or infrastructure processes (e.g. check-in, boarding etc.). With the findings, harmonized recommendations will be put forward and demonstrations at air (Vienna International Airport), land (main road border between Poland and Ukraine), and sea borders (Harbour of Mykonos, Greece) will be set up.

Objective 4 - Using architecture based upon innovative technology

FastPass will focus on technologies which cover document checking, biometric identification, intelligent surveillance of pre-border and border area, gate technology etc. And of course, the interoperability and adaptability of the system architecture will be examined too.

It is not difficult to imagine the challenges of interoperability on the ABC which runs in so many nations to achieve a common objective, and in fact, three other EES systems have already been in use in the Schengen Area. They certainly will serve as good support to FastPass and the future ABC.

EURODAC

Operated since 2003, EURODAC is an EU asylum fingerprint database which helps to determine responsibility for examining application by comparing fingerprint datasets. When a person applies for asylum, his / her fingerprints are transmitted to EURODAC central system connected to all member states, no matter where the asylum seeker is in the EU. With the upcoming new EURODAC regulations in July 2015, new time limits will

be set to reduce time lapses between taking and sending fingerprints to the Central Unit of EURODAC. It will also extend the use of database beyond asylum purpose, to allow national police forces and Europol to compare fingerprints linked to serious criminals and terrorists investigations with those in EURODAC database in strictly controlled circumstances.

Visa Information System (VIS)

Consisted of a central IT system and a communication infrastructure which links the central system to national systems, VIS allows Schengen States to exchange visa data. It connects all external border crossing points of Schengen States and consulates in non-EU countries, and also performs biometric matching for identification and verification purposes.

To make VIS work, 10 fingerprints and a digital photograph



are collected from each visa applicant, and these biometric data and other personal particulars will be recorded in the central database for a five-year period. Frequent travellers to the Schengen States do not need to give new finger scans, though at external borders of Schengen area, finger scans of visa holders may be compared against those in the database to identify any mismatch.

In addition to enhancing security and facilitating checks and issuance of visa, VIS is also good at fighting abuses and preventing fraudulent behaviours such as “visa shopping”, that is, making further visa applications to other EU states when a first application is rejected.

Schengen Information System (SIS)

The largest information system for public security in Europe, SIS allows easy information exchange between national border control, customs and police authorities while ensuring a safe environment for the free movement of people with the EU. It holds information on persons who may have involved in serious crimes or may not have the right to enter or stay in the EU. It also gives alerts on missing persons or properties such as banknotes, cars, firearms ID documents etc. It is the responsibility of national authorities to enter information into SIS and forward it via the Central System to all Schengen States.

SIS has been set up as an inter-governmental initiative under the Schengen Convention, which is now integrated into

the EU framework. The second generation SIS (SIS II) was launched in April 2013 to enhance functionalities like the use of biometrics, new types of and links to alerts as well as stronger data protection. The SIS consists of three components, namely a Central System, EU States’ national systems and a communication infrastructure between the two. IDM

The Schengen Area and Cooperation Explained

The Schengen area and cooperation are founded on the Schengen Agreement of 1985. The Schengen area represents a territory where the free movement of persons is guaranteed. The signatory states to the agreement have abolished all internal borders in lieu of a single external border. Here common rules and procedures are applied with regard to visas for short stays, asylum requests and border controls. Simultaneously, to guarantee security within the Schengen area, cooperation and coordination between police services and judicial authorities have been stepped up. Schengen cooperation has been incorporated into the European Union (EU) legal framework by the Treaty of Amsterdam of 1997.

Schengen Area nowadays covers most of the European Countries with an exception made for the United Kingdom. Although not members of the European Union, the following countries like Norway, Iceland, Switzerland and Lichtenstein are also part of the Schengen zone enjoying the same freedom of movement policy as the others.

Source: http://europa.eu/index_en.htm

The Schengen Area Member States:

1. Austria	10. Hungary	19. Poland
2. Belgium	11. Iceland	20. Portugal
3. Czech republic	12. Italy	21. Slovakia
4. Denmark	13. Latvia	22. Slovenia
5. Estonia	14. Lithuania	23. Spain
6. Finland	15. Luxembourg	24. Sweden
7. France	16. Malta	25. Switzerland
8. Germany	17. Netherlands	
9. Greece	18. Norway	

Source : <http://www.schengenvisainfo.com>